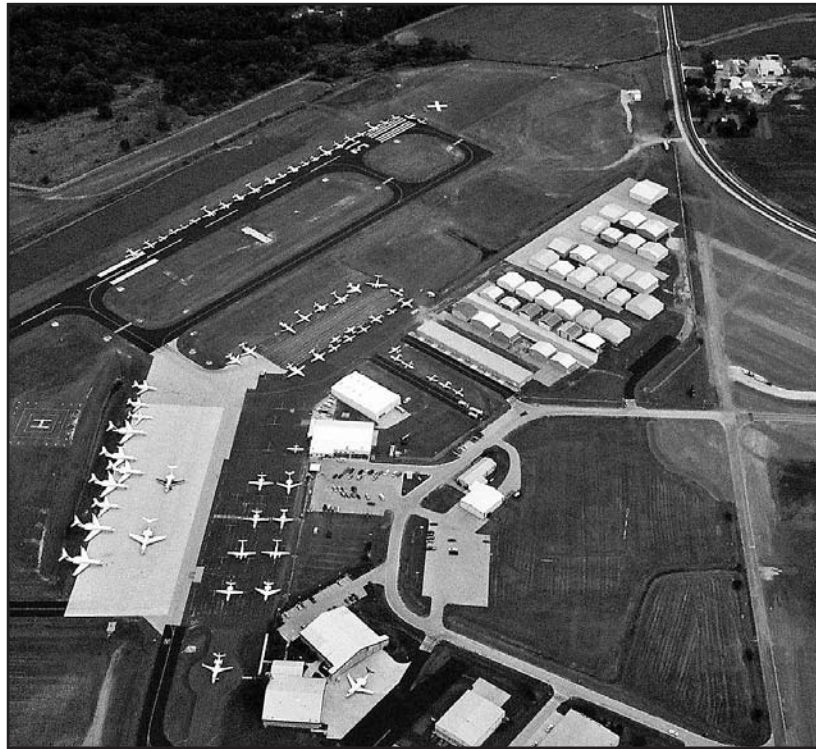


# The 2002 Economic Significance of the Aviation Industry in Wisconsin



## Summary

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# The Aviation Industry in Wisconsin

## *Economic Significance Summary*

The Wisconsin Department of Transportation's Bureau of Aeronautics periodically researches the economic impact of the aviation industry in Wisconsin. In addition to providing information on the significance of this industry to the economy, the results of the study aid policymakers in evaluating airport operations and improvements. This report summarizes the findings of the 2002 Wisconsin Aviation Economic Impact study.

### A Profile of the Wisconsin Aviation Network

The 2002 Wisconsin State Airport System is a network of 98 public-use airports. This system, which includes eight air carrier airports and 90 general aviation airports, links Wisconsin residents and businesses to the rest of the nation and the world. The airports of this network are eligible for federal and state airport improvement funds, and are the focus of this economic impact study. In addition to this Airport System, the state also has 407 privately-owned airports, 132 heliports, and 27 sea plane bases that serve important aviation needs but were outside the scope of this Aviation Impact Study.



### General Aviation

Wisconsin's 90 general aviation airports provide facilities for corporate travel, pilot training, and pleasure flyers, and are the centers for over 100 aviation-related businesses and industries. In 2002, there were over 3,600 general aviation aircraft based at these airports, and nearly 2 million general aviation operations.



*General Mitchell International Airport*

### Commercial Aviation

The state's eight commercial air carrier airports provided bases for 1,100 additional general aviation aircraft, and were the sites of 455,000 general aviation operations.

Wisconsin residents have access to regularly scheduled commercial airline service at these eight airports:

- Austin Straubel International (Green Bay)
- Central Wisconsin (Mosinee)
- Chippewa Valley Regional (Eau Claire)
- Dane County Regional (Madison)
- General Mitchell International (Milwaukee)
- Outagamie County Airport (Appleton)
- La Crosse Municipal
- Rhinelander-Oneida County (Rhinelander)

In 2002, these airports served nearly 5 million air travelers.

## The Study Approach

The study's analytical approach followed guidelines suggested by the Federal Aviation Administration (FAA) to facilitate comparability between similar studies in other states. Data for the analysis of the economic impacts of aviation was taken from a variety of sources. First, survey questionnaires were mailed to all the airport managers, airport tenants and Fixed Base Operators (FBO's), and military flight unit commanders in Wisconsin. In addition, travel agents statewide were surveyed to determine the importance of air travel to their business. The information provided by the survey effort was then supplemented by Wisconsin-specific data from the U.S. Bureau of Labor Statistics, the U.S. Bureau of Economic Analysis, and the U.S. Bureau of the Census. Other publicly-available information came from Wisconsin state agencies. Finally, the study drew upon data that was purchased from private data vendors.

The first step in measuring the economic impact of aviation in Wisconsin was to identify the spending on payroll, operating expenditures, capital expenditures (business investments or facility improvements), and traveling expenditures of the key groups that contribute to the economy through aviation-related activity. Because it is impossible to identify every expenditure in a state economy as complex as Wisconsin's, the study focused on these major groups:

- Commercial airport tenants (airlines, concessions such as gift shops and restaurants and auto rentals, freight operators, etc.)
- General aviation airports
- FBO's and other tenants at general aviation airports
- Military flight groups (Air National Guard, U.S. Army National Guard, U.S. Air Force), and employees of the FAA
- Air travelers

Spending by these groups ripples throughout the state economy, providing business directly or indirectly for nearly every Wisconsin

industry. Three categories of economic effects were described to assess the economic benefits associated with both aviation activity itself and with spending by air travelers: Direct Impacts, Indirect Impacts, and Induced Impacts. Both Indirect and Induced Impacts are secondary impacts produced by the initial direct aviation activity. These categories are defined according to FAA guidelines, and are described in the next section of this report.

An economic model of all 72 Wisconsin counties based upon input-output matrices was used to measure the multiplier effects related to indirect and induced impacts in this study. This model, the Impact Analysis for Planning (IMPLAN) economic model, was produced by the Minnesota IMPLAN Group, Inc. It is a computer-based model that estimates purchases and sales between the various sectors of the Wisconsin economy. It can yield statewide results, or focus on specific Wisconsin counties and groups of counties.

## Direct Impacts

Direct Impacts, as the term is defined for this analysis, are consequences of economic activities carried out at the airport by airlines, airport management, fixed base operators, and other tenants with a direct involvement in aviation. Employing labor, purchasing locally-produced goods and services, and contracting for airport construction and capital improvements are examples of airport activities that generate direct impacts.

Some direct impacts, like airport employment, occur on site; others, like local production of goods and services for use at the airport, may occur off site. The distinguishing feature of a direct impact is that it is an immediate consequence of airport economic activity.

Through a mail survey questionnaire and follow-up phone calls, information was gathered on the sales, operating expenditures, and capital improvement expenditures generated directly by aviation activity. Questionnaires were mailed to airport managers, FBO's and other airport

tenants, military aviation unit commanders, and travel agents in Wisconsin. These questionnaires requested information necessary to generate estimates of secondary economic impacts using the IMPLAN modeling process, including:

➤ **Employment -**

Information on full-time and part-time employment was converted to full-time equivalent positions.

➤ **Payrolls -**

Annual salaries paid to all workers.

➤ **Sales, Operating Expenses, and Capital Improvements -**

Economic activity for airport tenants is typically assumed to be the sum of annual gross sales and average annual capital expenditures. While this assumption works well for most profit-oriented tenants, it must be modified for government tenants such as military groups, for actual airport administration and operation, and airlines. Although airlines generate sales, the ticket revenue is usually transferred outside the state. (This is not true, however, of the airlines that are owned and operated in Wisconsin. Their sales were counted as direct economic activity.) In order to estimate the statewide impact of these important aviation activities, government, airport, and non-Wisconsin airline output is equated with the sum of operating expenditures and average annual capital improvement costs. The estimates of direct employment effects, generated by the IMPLAN model using this survey information, were adjusted to reflect the actual direct aviation employment at airports that was indicated by the survey returns. The secondary employment estimates generated by the model in this step of the analysis were then added to these direct employment figures to produce an estimate of total Direct Impact on employment.

As aviation expenditures directly enter the economy, they create successive waves of additional spending, multiplying the initial impacts. For example, businesses from which the aviation industry purchases goods and services will in turn purchase goods and services from their suppliers. In the terms

of this analysis, the sum of the initial aviation spending and the spending by suppliers to the aviation industry is the direct economic impact. In effect, the direct and indirect impact columns of the IMPLAN simulations were combined to produce the estimate of Direct economic impact using this FAA definition of Direct Impact. The induced economic impacts were modeled separately using information from the returned survey questionnaires.

The modeling process used in this analysis accounted for the proportion of that spending that “leaks” out of the local economy. The leakage occurs because of the regional import components of the goods and services purchased. The economic model used in this analysis employs separate multiplier factors for each of the industries that comprise the Wisconsin economy, and is specific to Wisconsin.

Aviation fuel sales comprise a significant portion of FBO sales in Wisconsin. To account for the sizable regional import component of those fuel sales, aviation fuel sales were modeled separately. From U.S. Energy Information Administration publications, Wisconsin Bureau of Aeronautics records, and phone interviews with fuel resellers, an average wholesale price for the fuel was determined. Similarly, an average retail fuel price was determined, and the difference between the two (the margin) was modeled as retail fuel sales, rather than as economic activity in the air transportation sector.

## **Indirect Impacts**

In this analysis, these impacts derive primarily from off-site economic activities that are attributable to the airport. For example, air travelers spend money in their destination communities on such things as hotel rooms, meals, retail shopping, rental cars, and recreation. The businesses that provide these services employ workers, purchase supplies from other businesses, and invest in business improvements. These waves of spending are known as the indirect economic impact.



Information was gathered on the numbers of air travelers and on their average expenditures. As with the other two types of impact, this spending was modeled to account for successive rounds of spending, and for specific regional import components of the goods and services purchased.

► **Commercial Service Visitors**

This category includes estimated non-local passengers (visitors) arriving via commercial airlines at Wisconsin's scheduled service airports. The total number of enplanements in 2002 for each commercial service airport was reduced to net out transfer passengers and arriving local residents. This produced an estimate of the arriving visitors at each airport. The sum of spending by these visitors initiated the indirect economic impacts attributable to commercial service air travelers.

► **General Aviation Visitors**

This category includes estimated non-local passengers arriving via private and corporate aircraft. For this analysis, general aviation visitors were assumed to be that portion of each airport's itinerant general aviation operations which is non-local, or visiting, in nature. The number of non-based itinerant operations (take-offs and landings) in 2002 for each general aviation airport was drawn from the State Airport System Plan. This data was combined with the average number of passengers per plane for each airport. The product of these two numbers for each airport was then halved to produce an estimate of the number of non-local general aviation arriving visitors at each airport in 1995.

Information on air traveler spending in Wisconsin came from two sources: the report, *The Economic Impact of Expenditures By Travelers In Wisconsin Calendar Year 1995*, which was prepared by Davidson-Peterson Associates, Inc. for the Wisconsin Department of Tourism; and a 1995 survey of air travelers in Wisconsin by D.K. Shifflet & Associates Ltd.. These figures were updated by the Consumer Price Index (CPI) to account for inflation since 1995. Air traveler spending on five separate

categories was assumed to exert the initial indirect economic impact, which then spurred subsequent rounds of spending in the Wisconsin economy. Those categories were Food & Drink; Retail Shopping; Recreation & Entertainment; Lodging; and Ground Transportation.

The table below lists the estimated amounts spent by each visitor per day on these items, as well as the IMPLAN model sectors into which the spending was entered.

Daily Air Traveler Spending in Wisconsin		
<i>Food &amp; Drink</i>	IMPLAN 481	<b>\$67.70</b>
<i>Shopping</i>	IMPLAN 411	<b>\$57.30</b>
<i>Recreation</i>	IMPLAN 478	<b>\$59.90</b>
<i>Lodging</i>	IMPLAN 479	<b>\$57.30</b>
<i>Ground Transportation</i>	IMPLAN 432	<b>\$18.20</b>

## Induced Impacts

These are multiplier effects of the direct impacts. They are the increases in employment and incomes created by the household expenditures of aviation and aviation-related workers. For example, part of an aviation employee's pay is spent for food, housing, and other expenses within a community. This money is income for the recipient businesses and their employees, and part of these second-round incomes are also spent locally, creating a multiplier effect as successive waves of spending occur. This is known as induced economic impact.

Survey information was gathered on all aviation employee payrolls in Wisconsin. This includes military and civilian employees, airport administration employees, airline employees, airport concession employees, and aviation business employees. The sum of these wages was then reduced to account for direct and indirect taxes and for savings. The remainder was modeled as spending in the local economy by the households of aviation employees. The modeling process not only accounted for these subsequent rounds of local spending, but

for the portion of that spending that leaks from the regional economy, again as a result of the regional import components of the goods and services purchased.

Total economic impacts are the sum of the direct, indirect, and induced impacts. The study estimates direct, indirect, induced, and total impacts in terms of three key economic variables: employment, personal income, and output.



Shell Lake Municipal Airport

Estimates are provided for the direct, indirect, and induced effects of general aviation, commercial air carrier aviation, and Federal aviation activity (military and the FAA) on those three variables. The total economic impacts of all this aviation activity are then summed and expressed on a statewide basis.

## General Aviation Airport Impacts

Wisconsin's 90 general aviation (GA) airports in the state system and the businesses they support generated a total of over \$608 million in direct expenditures and sales in 2002. The airports and businesses at the airports supplied a total of 3,420 jobs. In addition, the community businesses that supplied these airports and airport businesses generated almost \$276 million dollars in sales, and provided 3,150 more jobs. Consequently,

the total **direct** economic impact of Wisconsin's Airport System Plan general aviation airports was:

- **\$884.3 million in output in 2002;**
- **supplied 6,570 jobs;**
- **and provided over \$283 million in personal income to Wisconsin workers.**

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Wisconsin's general aviation airports generated over \$1.5 billion in output.

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The economic impact of these airports and businesses is not limited to those direct effects, but includes **induced** effects as well. As general aviation and aviation-related workers spent their wages, they supported:

- **1,704 jobs;**
- **generated over \$200 million in additional output (sales);**
- **and \$49 million in personal income for the grocers, service station owners, barbers, etc. in their communities throughout the state.**

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In 2002, Wisconsin's general aviation airports generated 16,827 jobs.

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In addition, air travelers using these general aviation airports spent money in the communities they visited. This **indirect** economic effect contributed:

- **over \$446 million in output (sales) to the Wisconsin economy;**
- **supported 8,553 jobs;**
- **and generated \$156 million in personal income.**

The **total economic impact** of Wisconsin System Plan general aviation airports in 2002 was:

- **over \$1.5 billion in output;**
- **16,827 jobs;**
- **and \$488 million in personal income.**



*Sheboygan County Memorial Airport*

## **General Aviation-Related Businesses**

The largest part of the direct economic impact of general aviation comes from such businesses as air taxi operators, aircraft mechanics and dealers, and FBO's. Most of these businesses are located on or near public-use airports. FBO's are an integral part of the aviation network, providing such services as refueling, flight instruction, avionics, and aircraft sales and service.

There are 100 FBO's operating at Airport System Plan public-use airports in Wisconsin. Their activities generated \$602 million in sales. They directly employed 3,260 workers, and their business activity indirectly supported another 4,830 jobs in Wisconsin.

Hundreds of businesses use general aviation airports to conduct their everyday business, further stimulating the Wisconsin economy. The \$446 million in general aviation air traveler spending is enabled by the activities of these FBO's and other general aviation airport businesses.





Wisconsin Air National Guard

## The Federal Presence: Military Aviation and the FAA in Wisconsin

Military aviation activity is a significant force in the Wisconsin economy. There are Air National Guard units in Milwaukee, Madison, and at Camp Douglas. There are also U.S. Army National Guard flight units in Madison, Milwaukee, and at Fort McCoy. All these units employ both military and civilian personnel, purchase local goods and services for their day-to-day operations, and contract with local businesses for construction projects as well as for operations.

In addition, there are FAA employees located at three air traffic control towers, administrative offices and an FAA Flight Service Station in Wisconsin.

In 2002, these military flight units and the FAA employed a total of 4,186 workers, both military and civilian. Their total payroll was nearly \$104 million. In addition, these units spent nearly \$20 million on construction and facility improvements that year, and spent \$51 million for everyday maintenance and operations.

As these service men and women and civilian employees spent their wages, they supported:

- another 1,000 jobs;
- generated nearly \$30 million in personal income;
- and over \$116 million in output (sales).

The total economic impact of U.S. military aviation activity in Wisconsin in 2002 is summarized in the table below.

Total Economic Impact of Military Aviation	
Employment	<b>5,190 jobs</b>
Personal Income	<b>\$132.6 million</b>
Output	<b>\$116 million</b> plus another <b>\$51 million</b> in purchases from regional businesses.



*Dane County Regional Airport*

## Commercial Service Airport Impacts

Airports in eight cities in Wisconsin offer regularly scheduled commercial airline service to the rest of the nation and the world. In addition to their vital air service roles, these airports are centers of economic activity that generate a large share of aviation's total economic impact in Wisconsin.

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Airports in eight cities in Wisconsin offer regularly scheduled commercial airline service to the rest of the nation and the world.

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Besides employing personnel to manage the day-to-day operations at the airport, commercial service airports are centers for airline operations, air freight operations, car rental outlets, restaurants, gift shops, customs brokerages, and travel agencies. The **direct** economic impact of these activities in 2002 was:

- nearly \$120 million to the Wisconsin economy;
- 2,832 jobs;
- and \$154 million in personal income to Wisconsin residents.

The full-and-part-time employees of these airports, of concessions at the airports, and of scheduled air carriers exerted these **induced** impacts in 1995 as they spent their wages:

- \$157 million in output;
- 1,338 jobs;
- and \$39 million in personal income.

Air travelers who use the commercial service airports spend money on restaurants, retail shopping, lodging, recreation, and car rentals in Wisconsin. In 2002, these expenditures had **indirect** economic impacts of:

- over \$811.4 million in sales;
- supported 15,553 jobs;
- and generated over \$287 million in personal income for Wisconsin residents.

The **total economic impact**—direct, indirect, and induced—of the commercial service airports in Wisconsin was:

- over \$1 billion dollars in output;
- supported 19,720 jobs;
- and generated over \$480 million in personal income.

## Wisconsin Businesses Rely On Aviation

Wisconsin businesses ship products via air freight every day. This streamlines their production, aids in “just-in-time” manufacturing processes, and expands their market reach. Regular air cargo services are available at six airports throughout the state, and express carriers also use feeder services originating at seven other public airports. In 2002, Wisconsin businesses shipped 128 million pounds of air freight through these facilities.

But businesses use aviation in other ways as well. Of the 4,900 general aviation aircraft based at Wisconsin airports in 2002, nearly 2,000 were owned by corporations doing business in Wisconsin. Aviation allows businesses to quickly move key personnel from one site to another, increasing their productivity.

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In 2002 Wisconsin businesses shipped 128 million pounds of air freight through these facilities.

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During the period between 1997 and 2001, 5% of new or expanded manufacturing businesses in the state were located within 15 miles of a public-use airport capable of handling corporate jets. These new and expanded manufacturers provided over 34,000 jobs for Wisconsin residents. The presence of a public airport capable of handling corporate aircraft is often a factor considered when larger companies select a business site.



## The EAA Annual Convention


Every year the Experimental Aircraft Association (EAA) hosts a fly-in convention at their Aviation Center in Oshkosh. Hundreds of thousands of aircraft enthusiasts from around the world attend this week-long event, many of them flying their own aircraft. Thousands of visiting aircraft land at Wittman Regional Airport in Oshkosh and at reliever airports in Appleton and Fond du Lac during the convention. In 2002, an estimated 770,000 people attended this event, spending money on food, lodging, retail shopping, entertainment, and recreation not only in the Oshkosh area, but around the state as they visited other communities.

- In 2002, visitor spending from this convention topped \$80 million.


## What's the Impact of a Single Airport?


We know that the network of general aviation airports in Wisconsin contributed \$1.5 billion to the Wisconsin economy in 2002, but how significant is a single general aviation airport to the Wisconsin economy?

General aviation airports in the Airport System Plan network are divided into four categories:

 **Transport/Corporate:** capable of serving corporate jets and small passenger and cargo jet aircraft

 **General Utility:** capable of serving all small general aviation non-jet aircraft

 **Basic Utility-B:** capable of serving small single and twin-engine piston aircraft of less than 12,500 pounds gross weight

 **Basic Utility-A:** serving small aircraft less than 6,000 pounds gross weight

Each kind of general aviation airport has direct, indirect, and induced economic effects on the community and on the state. What follows are analyses of representative airports in each of these categories.

### Transport/Corporate: New Richmond Municipal Airport

This airport, located in the city of New Richmond, is a transport/corporate airport. In 2002 the airport recorded 41,500 aircraft operations and served 130 based aircraft. Aviation activity at the airport exerted the following effects on the community and the state.

**Direct** effects as a result of sales and operating expenditures at the airport:

- \$1.9 million in output;
- 18 jobs;
- and over \$850,000 in payroll.

**Induced** effects as aviation employees spent their wages in the community:

- over \$1.8 million in sales (output);
- 64 jobs;
- and \$760,000 in personal income.

**Indirect** effects as air travelers using the airport spent money in the community:

- \$1.3 million in sales (output);
- 20 jobs;
- and over \$486,000 in personal income.

It all adds up to a **total annual economic impact** of:

- \$5.1 million in output;
- 102 jobs;
- and \$2.1 million in personal income circulating through the community and state.

### **General Utility: Burlington Municipal Airport**

Burlington Municipal Airport is located in Racine County. In 2000, the airport recorded over 52,000 operations and served 110 based aircraft. Aviation-related activity at the airport generated the following effects.

**Direct** effects as a result of sales and operating expenditures at the airport:

- \$4.3 million in output;
- 52 jobs;
- and \$2.1 million in personal income.

**Induced** effects as aviation employees spent their wages in the community:

- \$1.6 million in sales (output);
- another 52 jobs in the region;
- and \$723,000 in personal income.

**Indirect** effects as air travelers using the airport spent money in the community:

- \$19 million in sales (output);
- 275 jobs;
- and \$9.1 million in personal income.

It all adds up to a **total annual economic impact** of:

- \$24.9 million in output;
- 379 jobs;
- and \$11.8 million in personal income circulating through the community and state.

### **Basic Utility: Mauston – New Lisbon Union Airport**

This is a smaller general aviation airport that is centrally located between the cities of Mauston and New Lisbon in Juneau County. In 2003, the airport recorded 6,553 aircraft operations and 15 based aircraft. The economic impacts resulting from aviation activity at this airport are detailed below.

**Direct** effects as a result of sales and operating expenditures at the airport:

- \$297,000 in output;
- 2 jobs;
- and \$59,800 in personal income.

**Induced** effects as aviation employees spent their wages in the community:

- \$300,000 in sales (output);
- 9 jobs;
- and another \$111,000 in personal income.

**Indirect** effects as air travelers using the airport spent money in the community:

- \$157,000 in sales (output);
- 3 jobs;
- and \$52,000 in personal income.

It all adds up to a **total annual economic impact** of:

- \$753,000 in output;
- 14 jobs;
- and \$222,000 in personal income circulating through the community and state.





## The Bottom Line

The Wisconsin airport system links businesses and residents to the rest of the nation and the world. Both commercial air carrier airports and general aviation airports are important resources for corporations seeking to expand or locate in the state. In addition to commercial air service and general aviation facilities, Wisconsin aviation provides such “quality of life” amenities as emergency medical services, flight training, and environmental management.

But airports and their associated activities are themselves economic assets to communities, providing employment, purchasing goods and services from other businesses, and generating income as aviation-related spending circulates through the economy. This study focused on the importance of aviation as an industry to the Wisconsin economy, examining its economic significance in terms of jobs, personal income, and output.

The total economic significance for 2002 — direct, indirect, and induced is presented in the table below.

Total 2002 Economic Significance on the Aviation Industry in Wisconsin			
	Output	Personal Income	Jobs
DIRECT	\$1.1 Billion	\$541 Million	13,590
INDUCED	\$.5 Billion	\$117 Million	4,042
INDIRECT	\$1.2 Billion	\$443 Million	24,106
<b>TOTAL</b>	<b>\$2.8 Billion</b>	<b>\$1.1 Billion</b>	<b>41,738</b>

*Note: totals may not add exactly due to numerical rounding of results.*

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**More information on Wisconsin's airports  
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[www.dot.wisconsin.gov/modes/air.htm](http://www.dot.wisconsin.gov/modes/air.htm)